ESRF	**Experiment title:** Self-assembly of chromogenic elastomers with tissue-like mechanical properties	**Experiment number**: SC-4731
Beamline: ID02	**Date of experiment**: ID02 05/03/2018 - 07/03/2018	**Date of report**:
Shifts: 6	**Local contact(s)**:	*Received at ESRF:*

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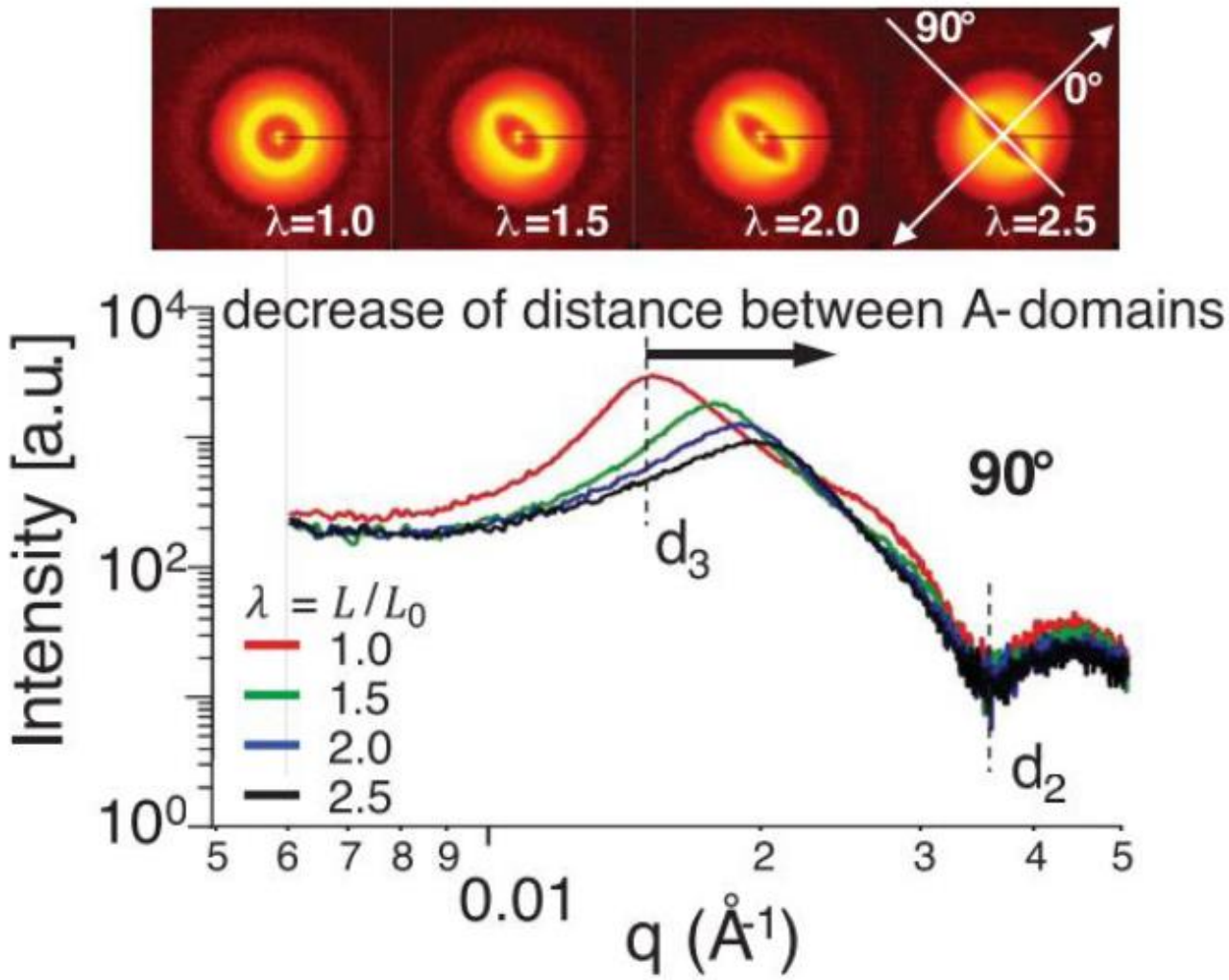
Report:

Data from experiment **SC-4731** obtained on ID02 resulted in the following publication:
Dobrynin, A. V., Rosenthal, M., Vatankhah-Varnosfaderani, M., Clair, C., Magonov, S., Sztucki, M., … Keith, A. N. (2018). Chameleon-like elastomers with molecularly encoded strain-adaptive stiffening and coloration. *Science*, *359*(6383), 1509–1513. https://doi.org/10.1126/science.aar5308

Active camouflage is widely recognized as a soft-tissue feature, and yet the ability to integrate adaptive coloration and tissuelike mechanical properties into synthetic materials remains elusive. We provide a solution to this problem by uniting these functions in moldable elastomers through the self-assembly of linear-bottlebrush-linear triblock copolymers. Microphase separation of the architecturally distinct blocks results in physically cross-linked networks that display vibrant color, extreme softness, and intense strain stiffening on par with that of skin tissue. Each of these functional properties is regulated by the structure of one macromolecule, without the need for chemical cross-linking or additives. These materials remain stable under conditions characteristic of internal bodily environments and under ambient conditions, neither swelling in bodily fluids nor drying when exposed to air.


λ=1.0
λ=1.5
λ=2.0
λ=2.5
90°
0°
decrease of distance between A-domains
Intensity [a.u.]
10^4
10^2
10^0
λ = L / L0
1.0
1.5
2.0
2.5
d3
d2
90°
5 6 7 8 9
0.01
2
3
4
5
q (Å^-1)